SGS-CSTC Standards Technical Services
(Shanghai) Co., Ltd.

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1 Cover Page

FCC REPORT

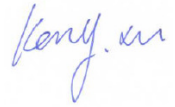
Application No.:	SHEM1409002330RF
Applicant:	Hansong (Nanjing) Technology Ltd.
FCC ID:	XCO–MUSAIC1401
IC:	7756A–MUSAIC1401
Equipment Under Test (EUT): **NOTE:** The following sample(s) submitted was/were identified on behalf of the client as	
Product Name:	Music Player
Model No.:	MP5
Standards:	FCC PART 15 Subpart C: 2014 RSS-210 Issue 8 (December 2010) RSS-Gen Issue 4 (November 2014)
Date of Receipt:	September 12, 2014
Date of Test:	December 08, 2014 to December 19, 2014
Date of Issue:	January 04, 2015
Test Result:	**PASS ***

*In the configuration tested, the EUT detailed in this report complied with the standards specified above.

Tony Wu
E&E Section Manager
SGS-CSTC (Shanghai) Co., Ltd.

2 Version

Revision Record				
Version	**Chapter**	**Date**	**Modifier**	**Remark**
00	/	January 04, 2015	/	Original

Authorized for issue by:				
Engineer		Eddy Zong **Print Name**		
Clerk		Susie Liu **Print Name**		
Reviewer		Keny Xu **Print Name**		

3 Test Summary

Test Item	FCC Requirement	IC Requirement	Test method	Result
Antenna Requirement	FCC Part 15, Subpart C Section 15.203	RSS-Gen 7.1.2 Section 8.1.3	ANSI C63.10(2009)	PASS
AC Power Line Conducted Emission	FCC Part 15, Subpart C Section 15.207	RSS-Gen Section 8.8	ANSI C63.10(2009)	PASS
Field Strength of the Fundamental Signal	FCC Part 15, Subpart C Section 15.231 (e)	RSS-210 Issue 8 Annex 1.1 Table a	ANSI C63.10(2009)	PASS
Spurious Emissions	FCC Part 15, Subpart C Section 15.231 (e)/15.209	RSS-Gen Section 8.9 & 8.10	ANSI C63.10(2009)	PASS
20dB Bandwidth	FCC Part 15, Subpart C Section 15.231 (c)	---	ANSI C63.10(2009)	PASS
99% Occupied Bandwidth	---	RSS-Gen Section 6.6	RSS-Gen section 6.6	PASS
Dwell Time	FCC Part 15, Subpart C Section 15.231 (a)(1)	---	ANSI C63.10(2009)	PASS

4 Contents

5 General Information

5.1 Client Information

Applicant:	Hansong (Nanjing) Technology Ltd.
Address of Applicant:	8th Kangping Road, Jiangning Economy and Technology Development Zone, Nanjing, 211106, China
Manufacturer:	Musaic Ltd.
Address of Manufacturer:	4-5 Bonhill Street, London EC2A 4BX, UK
Factory:	Hansong (Nanjing) Technology Ltd.
Address of Factory:	8th Kangping Road, Jiangning Economy and Technology Development Zone, Nanjing, 211106, China

5.2 General Description of E.U.T.

Brand Name:	MUSAIC	
Product Description:	Fixed product, Manual activation transmission	
Rated Input:	DC 18V 3.3A	
Adapter(For MP5):	Model No.:	FJ-SW1802300D
	Rated Input:	AC 100V-240V 50/60Hz 1.5A MAX
	Rated Output:	DC 18V 2.3A
	Cable length:	AC port: 180 cm (2 wires)
		DC port: 180 cm

5.3 Technical Specifications

Operation Frequency:	433.92MHz
Modulation Technique:	ASK
Number of Channel:	1
Antenna Type	Integral Antenna

5.4 Description of Support Units

The EUT has been tested independently

5.5 Details of Test Mode

Test Mode	Detail description of the test mode
Engineering mode	Keeps EUT working in continuous transmitting mode.

Remark: The final measurement is performed in worst case emission of press lighting key (button 6)

5.6 Test Location

All tests were performed at:
SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. E&E Lab
No.588 West Jindu Road, Songjiang District, Shanghai, China. 201612.
Tel: +86 21 6191 5666
Fax: +86 21 6191 5678
No tests were sub-contracted.

5.7 Test Facility

- **CNAS (No. CNAS L0599)**

CNAS has accredited SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. to ISO/IEC 17025:2005 General Requirements for the Competence of Testing and Calibration Laboratories (CNAS-CL01 Accreditation Criteria for the Competence of Testing and Calibration Laboratories) for the competence in the field of testing. Date of expiry: 2017-07-14.

- **FCC – Registration No.: 402683**

SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. has been registered and fully described in a report filed with the Federal Communications Commission (FCC). The acceptance letter from the FCC is maintained in our files. Registration No.: 402683, Expiry Date: 2017-09-16.

- **Industry Canada (IC) – IC Assigned Code: 8617A**

The 3m Semi-anechoic chamber of SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 8617A-1. Expiry Date: 2017-06-18.

- **VCCI (Member No.: 3061)**

The 3m Semi-anechoic chamber and Shielded Room of SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. has been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: R-3868 and C-4336 respectively. Date of Registration: 2012-05-29. Date of Expiry: 2015-05-28.

5.8 Measurement Uncertainty

No.	Parameter	Measurement Uncertainty
1	Radio Frequency	< ±1 x 10^{-5}
2	Total RF power, conducted	< ±1.5 dB
3	RF power density, conducted	< ±3 dB
4	Spurious emissions, conducted	< ±3 dB
5	All emissions, radiated	< ±6 dB (30MHz – 1GHz) < ±6 dB (above 1GHz)
6	Temperature	< ±1°C
7	Humidity	< ±5 %
8	DC and low frequency voltages	< ±3 %

6 Equipments Used during Test

Item	Test Equipment	Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due date
1	EMI test receiver	Rohde & Schwarz	ESCS30	100086	2014-02-13	2015-02-12
2	Line impedance stabilization network	SCHWARZBECK	NSLK8127	8127490	2014-02-13	2015-02-12
3	Line impedance stabilization network	ETS	3816/2	00034161	2014-02-13	2015-02-12
4	Spectrum Analyzer	Rohde & Schwarz	FSP-30	2705121009	2014-02-13	2015-02-12
5	EMI test receiver	Rohde & Schwarz	ESU40	100109	2014-02-13	2015-02-12
6	Active Loop Antenna (9kHz to 30MHz)	Rohde & Schwarz	FMZB 1519	1519-034	2014-03-19	2015-03-18
7	Broadband UHF-VHF ANTENNA (25MHz to 2GHz)	SCHWARZBECK	VULB9168	9168-313	2014-02-13	2015-02-12
8	Ultra broadband antenna (25MHz to3GHz)	Rohde & Schwarz	HL562	100227	2014-08-30	2015-08-29
9	Horn Antenna (1GHz to 18GHz)	Rohde & Schwarz	HF906	100284	2014-02-13	2015-02-12
10	Horn Antenna (1GHz to 18GHz)	SCHWARZBECK	BBHA9120D	9120D-679	2014-02-13	2015-02-12
11	Horn Antenna (14GHz to 40GHz)	SCHWARZBECK	BBHA 9170	BBHA9170373	2014-02-13	2015-02-12
12	Pre-amplifier (9KHz – 2GHz)	LNA6900	TESEQ	71033	2014-02-13	2015-02-12
13	Pre-amplifier (1GHz – 26.5GHz)	Rohde & Schwarz	SCU-F0118-G40-BZ4-CSS(F)	10001	2014-02-13	2015-02-12
14	Pre-amplifier (14GHz – 40GHz)	Rohde & Schwarz	SCU-F1840-G35-BZ3-CSS(F)	10001	2014-02-13	2015-02-12
15	Tunable Notch Filter	Wainwright instruments Gmbh	WRCT800.0/880.0-0.2/40-5SSK	9170397	2014-06-02	2015-06-01
16	High pass Filter	FSCW	HP 12/2800-5AA2	19A45-02	2014-06-02	2015-06-01
17	High-low temperature cabinet	Suzhou Zhihe	TL-40	50110050	2014-09-11	2015-09-10
18	AC power stabilizer	WOCEN	6100	51122	2014-06-02	2015-06-01
19	DC power	QJE	QJ30003SII	611145	2014-06-02	2015-06-01
20	Signal Generator (Interferer)	Agilent	SMR40	100555	2014-02-14	2015-02-13
21	Signal Generator (Blocker)	Rohde & Schwarz	SMJ100A	02.20.360.142	2014-02-13	2015-02-12
22	Splitter	Anritsu	MA1612A	M12265	/	/
23	Coupler	e-meca	803-S-1	900-M01	/	/

7 Test results and Measurement Data

7.1 Antenna Requirement

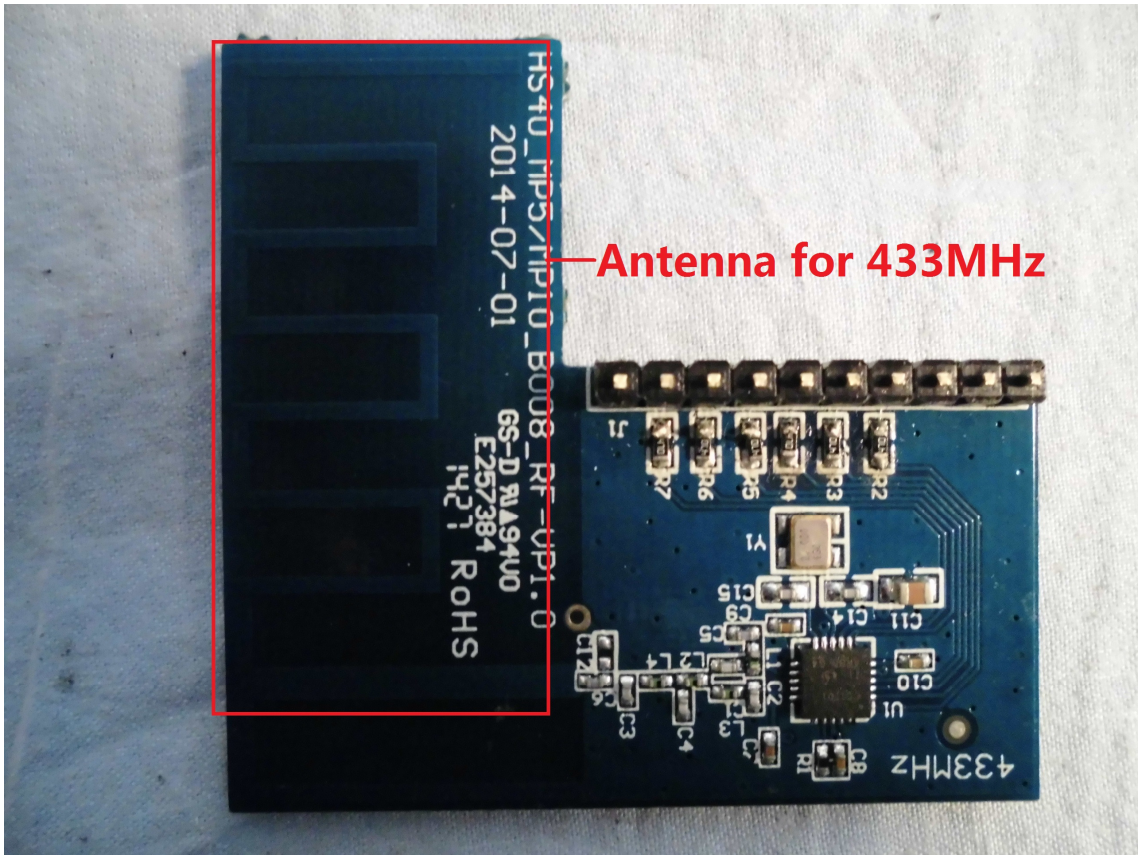
15.203 Requirement:

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

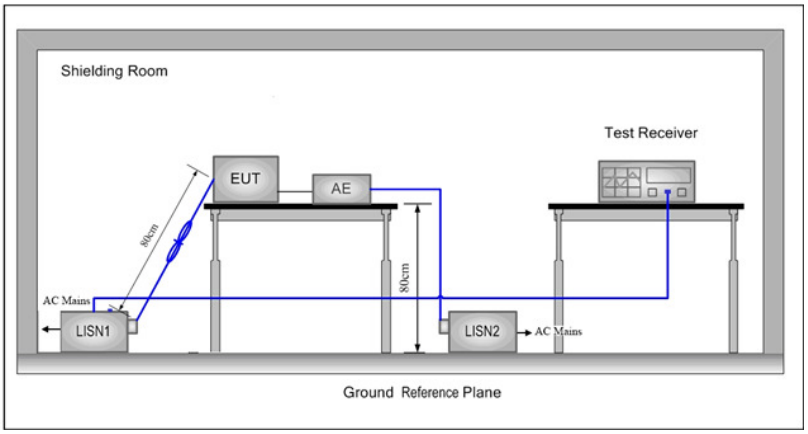
EUT Antenna:

The antenna is integrated and no consideration of replacement.

Antenna Configuration:

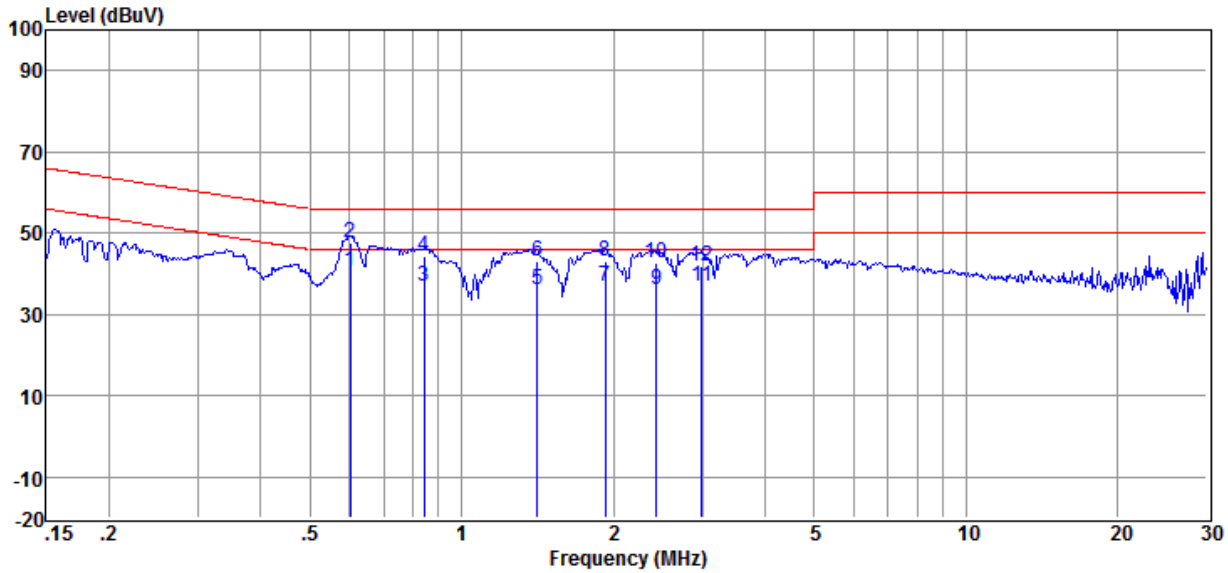


7.2 Conducted Emissions

<table>
<tr><td>Test Frequency Range:</td><td colspan="3">150kHz to 30MHz</td></tr>
<tr><td rowspan="5">Limit:</td><td rowspan="2">Frequency range (MHz)</td><td colspan="2">Limit (dBuV)</td></tr>
<tr><td>Quasi-peak</td><td>Quasi-peak</td></tr>
<tr><td>0.15-0.5</td><td>66 to 56*</td><td>66 to 56*</td></tr>
<tr><td>0.5-5</td><td>56</td><td>56</td></tr>
<tr><td>5-30</td><td>60</td><td>60</td></tr>
<tr><td colspan="3">* Decreases with the logarithm of the frequency.</td></tr>
<tr><td>Test Procedure:</td><td colspan="3">1) The mains terminal disturbance voltage test was conducted in a shielded room.
2) The EUT was connected to AC power source through a LISN 1 (Line Impedance Stabilization Network) which provides 50Ω/50μH + 5Ω linear impedance. The power cables of all other units of the EUT were connected to a second LISN 2, which was bonded to the ground reference plane in the same way as the LISN 1 for the unit being measured. A multiple socket outlet strip was used to connect multiple power cables to a single LISN provided the rating of the LISN was not exceeded.
3) The tabletop EUT was placed upon a non-metallic table 0.8m above the ground reference plane. And for floor-standing arrangement, the EUT was placed on the horizontal ground reference plane,
4) The test was performed with a vertical ground reference plane. The rear of the EUT shall be 0.4 m from the vertical ground reference plane. The vertical ground reference plane was bonded to the horizontal ground reference plane. The LISN 1 was placed 0.8 m from the boundary of the unit under test and bonded to a ground reference plane for LISNs mounted on top of the ground reference plane. This distance was between the closest points of the LISN 1 and the EUT. All other units of the EUT and associated equipment were at least 0.8 m from the LISN 2.
5) In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.10: 2009 on conducted measurement.</td></tr>
<tr><td>Test Setup:</td><td colspan="3"> 
</td></tr>
<tr><td>Test Results:</td><td colspan="3">N/A</td></tr>
</table>

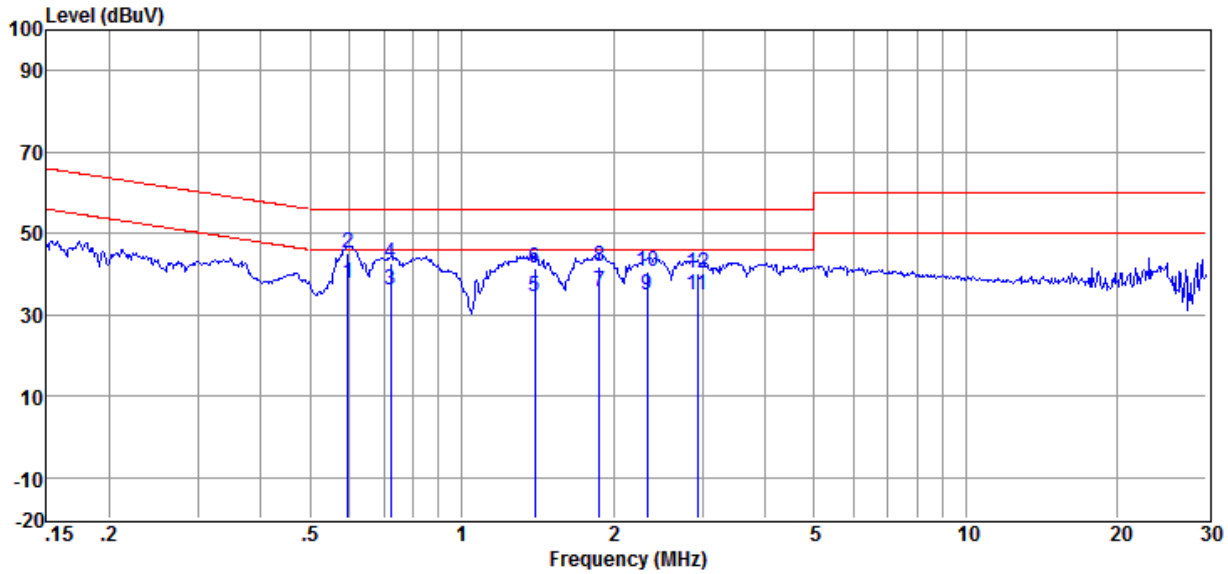
Measurement Data

Live Line:



Item	Freq.	Read Level	LISN Factor	Cable Loss	Level	Limit Line	Over Limit	Detector
(Mark)	(MHz)	(dBµV)	(dB)	(dB)	(dBµV)	(dBµV)	(dB)	
1	0.601	40.23	0.23	0.10	40.56	46.00	-5.44	Average
2	0.601	47.29	0.23	0.10	47.62	56.00	-8.38	QP
3	0.844	36.75	0.19	0.10	37.04	46.00	-8.96	Average
4	0.844	44.16	0.19	0.10	44.45	56.00	-11.55	QP
5	1.411	35.75	0.26	0.10	36.11	46.00	-9.89	Average
6	1.411	42.56	0.26	0.10	42.92	56.00	-13.08	QP
7	1.928	36.33	0.35	0.10	36.78	46.00	-9.22	Average
8	1.928	42.63	0.35	0.10	43.08	56.00	-12.92	QP
9	2.435	35.53	0.37	0.12	36.02	46.00	-9.98	Average
10	2.435	42.19	0.37	0.12	42.68	56.00	-13.32	QP
11	2.993	36.42	0.37	0.14	36.93	46.00	-9.07	Average
12	2.993	41.53	0.37	0.14	42.04	56.00	-13.96	QP

Neutral Line:



Item	Freq.	Read Level	LISN Factor	Cable Loss	Level	Limit Line	Over Limit	Detector
(Mark)	(MHz)	(dBµV)	(dB)	(dB)	(dBµV)	(dBµV)	(dB)	
1	0.595	37.38	0.24	0.10	37.72	46.00	-8.28	Average
2	0.595	44.89	0.24	0.10	45.23	56.00	-10.77	QP
3	0.724	35.77	0.19	0.10	36.06	46.00	-9.94	Average
4	0.724	42.27	0.19	0.10	42.56	56.00	-13.44	QP
5	1.396	33.57	0.60	0.10	34.27	46.00	-11.73	Average
6	1.396	40.64	0.60	0.10	41.34	56.00	-14.66	QP
7	1.878	34.71	0.93	0.10	35.74	46.00	-10.26	Average
8	1.878	40.63	0.93	0.10	41.66	56.00	-14.34	QP
9	2.334	33.76	0.90	0.12	34.78	46.00	-11.22	Average
10	2.334	39.66	0.90	0.12	40.68	56.00	-15.32	QP
11	2.931	33.84	0.76	0.14	34.74	46.00	-11.26	Average
12	2.931	39.28	0.76	0.14	40.18	56.00	-15.82	QP

Remark: Level = Read Level + LISN/ISN Factor + Cable Loss.

7.3 Radiation Emissions

Test frequency range	9KHz – 6GHz				
Test Site:	Measurement Distance: 3m (Semi-Anechoic Chamber)				
Receiver Setup:	Frequency	Detector	RBW	VBW	Remark
	0.009MHz-0.015MHz	Quasi-peak	200Hz	1KHz	Quasi-peak
	0.015MHz-30MHz	Quasi-peak	9kHz	30KHz	Quasi-peak
	30MHz-1GHz	Quasi-peak	120 kHz	300KHz	Quasi-peak
	Above 1GHz	Peak	1MHz	3MHz	Peak
		Peak	1MHz	10Hz	Average
Limit: (Spurious Emissions)	Frequency	Field strength (uV/m)	Limit (dBuV/m)	Remark	Measurement distance (m)
	0.009MHz-0.490MHz	2400/F(kHz)	-	Quasi-peak	300
	0.490MHz-1.705MHz	24000/F(kHz)	-	Quasi-peak	30
	1.705MHz-30MHz	30	-	Quasi-peak	30
	30MHz-88MHz	100	40.0	Quasi-peak	3
	88MHz-216MHz	150	43.5	Quasi-peak	3
	216MHz-960MHz	200	46.0	Quasi-peak	3
	960MHz-1GHz	500	54.0	Quasi-peak	3
	Above 1GHz	500	54.0	Average	3
			74.0	Peak	3
Limit: (Field strength of the fundamental signal)	Frequency	Limit (dBuV/m @3m)		Remark	
	433.09 - 434.61MHz	72.9		Average Value	
		92.9		Peak Value	
Test Procedure:	a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic camber. The table was rotated 360 degrees to determine the position of the highest radiation. b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower. c. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement. d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters (for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading. e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode. f. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average				

	method as specified and then reported in a data sheet. g. The radiation measurements are performed in X, Y, Z axis positioning. And found the Z axis positioning which it is worse case, only the test worst case mode is recorded in the report.
Test Setup:	

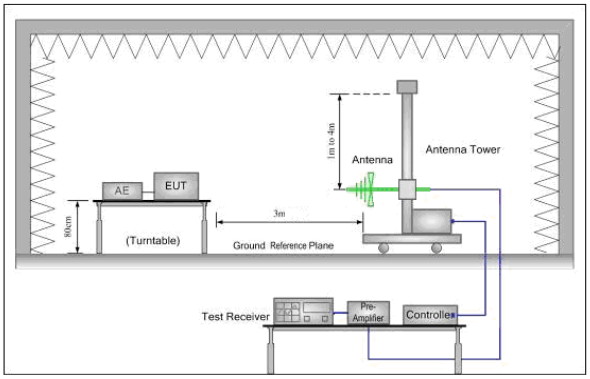


Figure 2. 30MHz to 1GHz

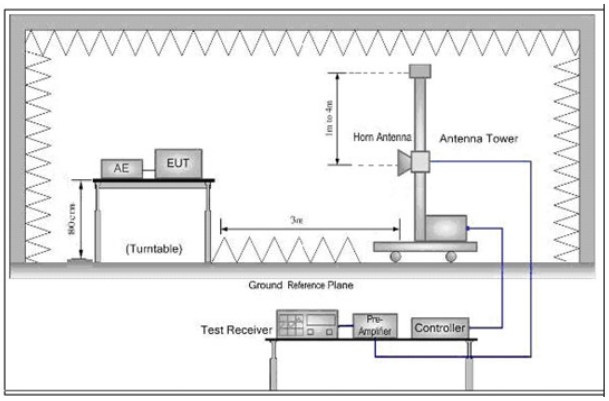


Figure 3. Above 1 GHz

Test Results:	Pass

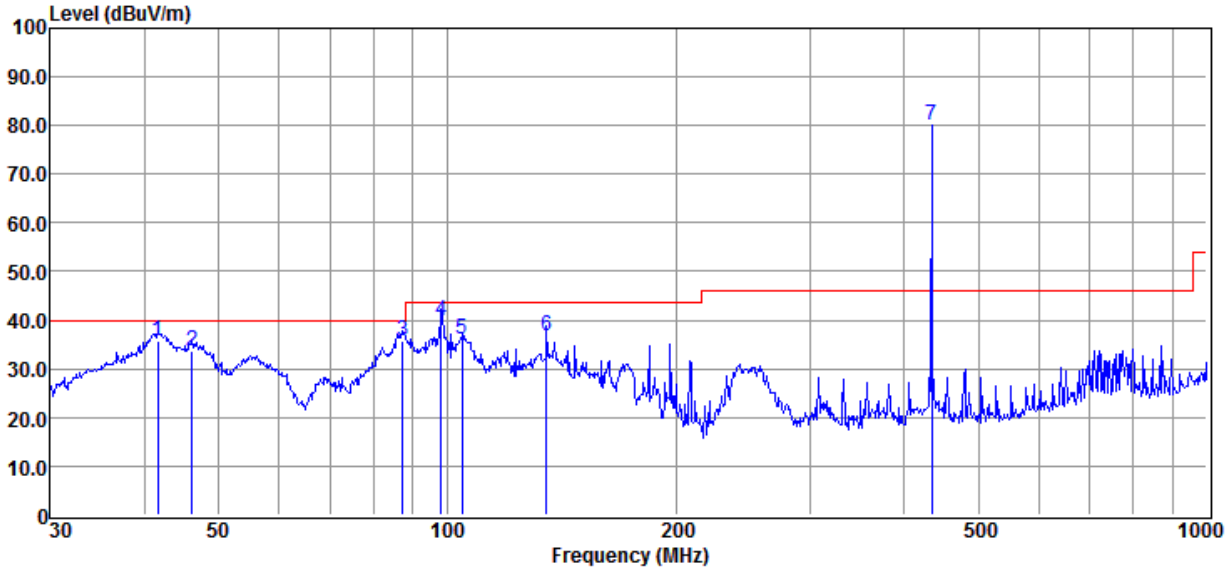
7.3.1 Field Strength of the Fundamental Signal

Frequency (MHz)	Result Level (dBµV/m)	Limit Line (dBµV/m)	Over Limit (dB)	Detector	Polarization
433.92	80.15	80.8	-0.65	Peak	Vertical
	79.53	80.8	-1.27	Peak	Horizontal

Remark: If the Peak value below the AV Limit, the AV test doesn't perform for this submission.

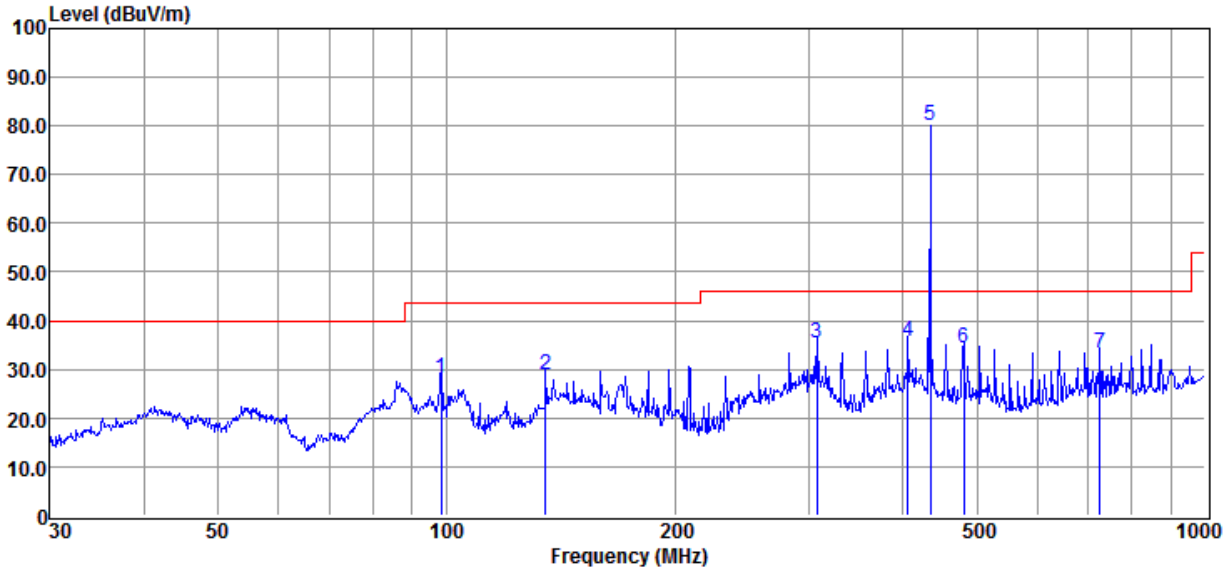
7.3.2 Spurious Emissions

Below 1GHz:



Item	Freq.	Read Level	Antenna Factor	Preamp Factor	Cable Loss	Result Level	Limit Line	Over Limit	Detector	Polarization
(Mark)	(MHz)	(dBµV)	(dB/m)	(dB)	(dB)	(dBµV/m)	(dBµV/m)	(dB)		
1	41.567	46.10	13.10	23.70	0.29	35.79	40.00	-4.21	QP	Vertical
2	46.178	44.12	13.00	23.70	0.34	33.76	40.00	-6.24	QP	Vertical
3	87.418	50.33	8.45	23.67	0.79	35.90	40.00	-4.10	QP	Vertical
4	98.142	53.70	9.01	23.66	0.90	39.95	43.50	-3.55	QP	Vertical
5	104.536	48.96	9.79	23.66	0.95	36.04	43.50	-7.46	QP	Vertical
6	135.032	47.94	11.40	23.64	1.10	36.80	43.50	-6.70	QP	Vertical
7	433.920	86.06	15.52	23.71	2.28	80.15	Fundamental signal		Peak	Vertical

Horizontal:



Item	Freq.	Read Level	Antenna Factor	Preamp Factor	Cable Loss	Result Level	Limit Line	Over Limit	Detector	Polarization
(Mark)	(MHz)	(dBµV)	(dB/m)	(dB)	(dB)	(dBµV/m)	(dBµV/m)	(dB)		
1	98.487	42.00	9.05	23.66	0.90	28.29	43.50	-15.21	QP	Horizontal
2	135.032	40.04	11.40	23.64	1.10	28.90	43.50	-14.60	QP	Horizontal
3	307.831	45.13	12.14	23.67	1.91	35.51	46.00	-10.49	QP	Horizontal
4	406.088	42.76	14.49	23.70	2.22	35.77	46.00	-10.23	QP	Horizontal
5	433.920	85.44	15.52	23.71	2.28	79.53	Fundamental signal		Peak	Horizontal
6	480.528	39.63	16.20	23.73	2.38	34.48	46.00	-11.52	QP	Horizontal
7	726.805	33.33	20.85	23.89	3.04	33.33	46.00	-12.67	QP	Horizontal

1GHz – 6GHz:

Mark	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Emission (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Detector	Polarization
1	1293.75	52.99	-7.41	45.58	54	-8.42	peak	Horizontal
2	3032.75	50.37	-0.13	50.24	54	-3.76	peak	Horizontal
3	5641.25	42.93	6.82	49.75	54	-4.25	peak	Horizontal
4	1293.75	56.43	-7.41	49.02	54	-4.98	peak	Vertical
5	2163.25	51.98	-2.93	49.05	54	-4.95	peak	Vertical
6	3032.75	53.4	-0.13	53.27	54	-0.73	peak	Vertical

Remark:

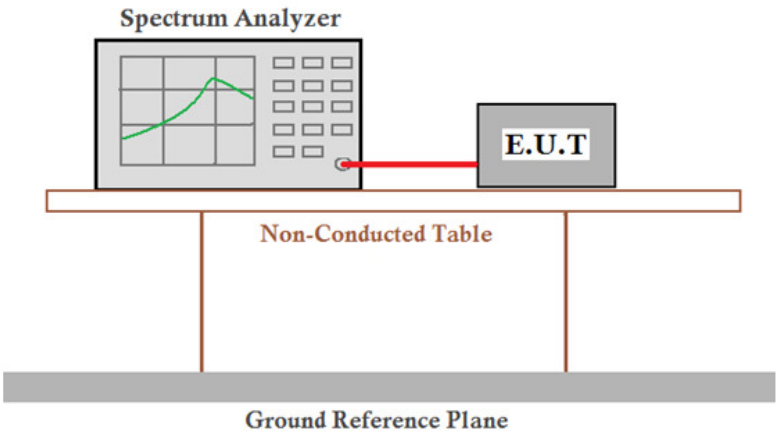
1) The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:

   Final Test Level =Receiver Reading Level +Antenna Factor + Cable Factor – Preamplifier Factor

2) If Peak Result comply with AV limit, AV Result is deemed to comply with QP limit

3) No any other emissions level which are attenuated less than 20dB below the limit. According to 15.31(o), the amplitude of spurious emissions from intentional radiators and emissions from unintentional radiators which are attenuated more than 20 dB below the permissible value need not be reported unless specifically required elsewhere in this Part. Hence there no other emissions have been reported.

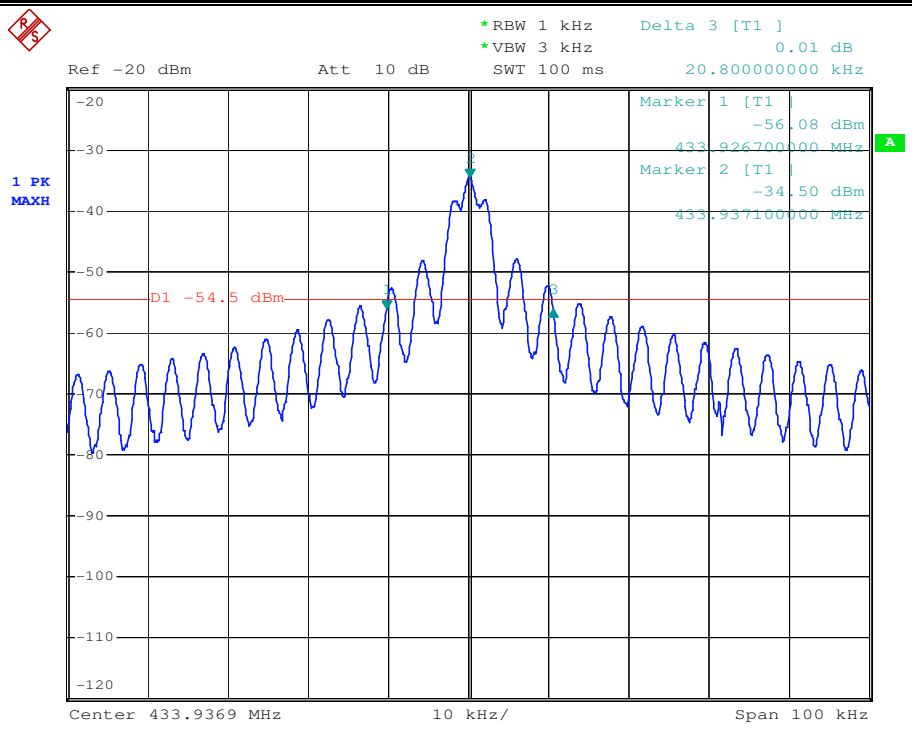
7.4 20dB Bandwidth

Test Setup:	
Test Mode:	The bandwidth of the emission shall be no wider than 0.25% of the center frequency for devices operating above 70 MHz and below 900 MHz. For devices operating above 900 MHz, the emission shall be no wider than 0.5% of the center frequency. Bandwidth is determined at the points 20 dB down from the modulated carrier.
Test Mode:	Transmitting mode
Test Results:	Pass

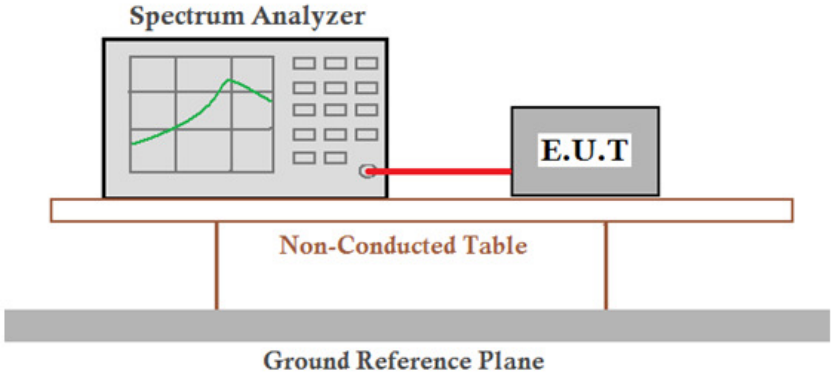
Test Data:

20dB bandwidth (kHz)	Limit (kHz)	Results
20.8	1084.8	Pass

Test plot as follows:



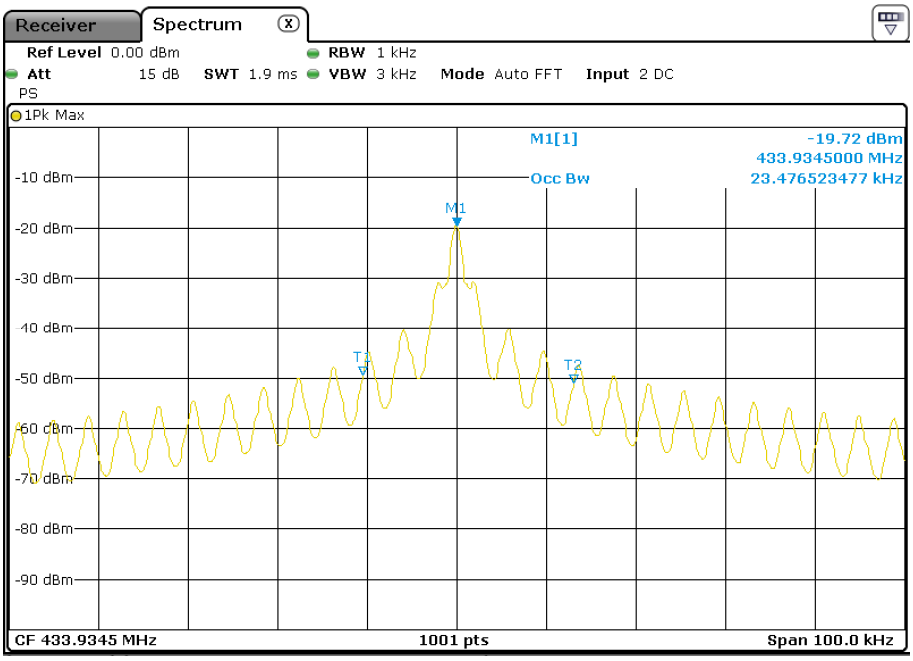
7.5 99% Occupied Bandwidth

Test Setup:	
Limit:	1) Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum; 2) Set the spectrum analyzer: Span = approximately 2 to 3 times the 20dB bandwidth, centred on the hopping channel; 3) Set the spectrum analyzer: RBW >= 1% of the selected span (set 30 kHz). VBW >= RBW. Sweep = auto; Detector Function = Peak. Trace = Max Hold. 4) Mark the peak frequency and 99% bandwidth points..
Test Mode:	Transmitting mode

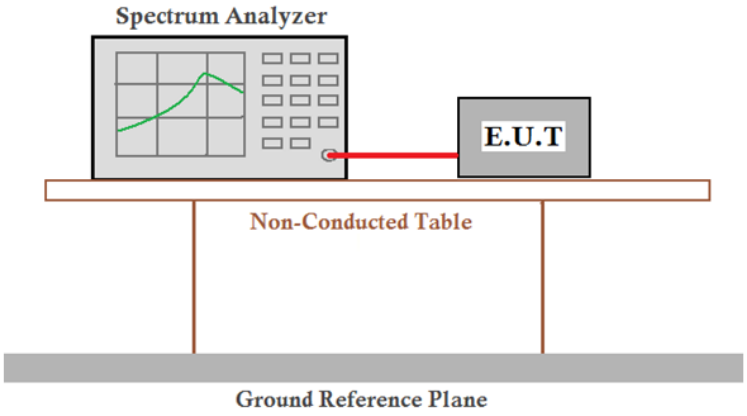
Test Data:

20dB bandwidth	23.48 kHz

Test plot as follows:



7.6 Dwell Time

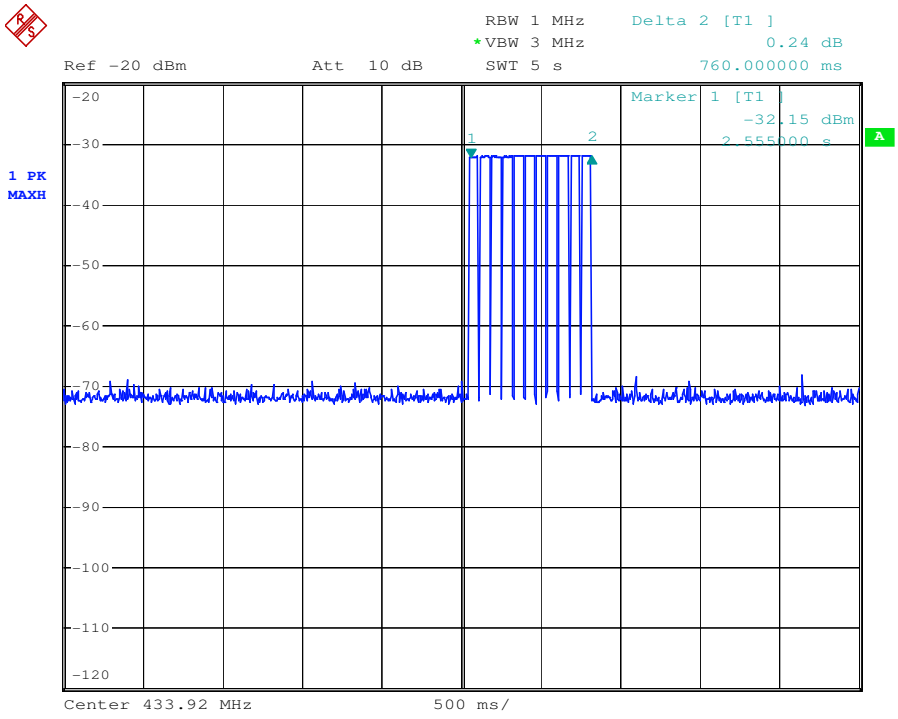
Test Setup:	
Limit:	15.231 (a): Not more than 5 seconds
Test Result:	Pass

Test Data:

The device is a manually operated transmitter shall employ a switch that will automatically deactivate the transmitter within not more than 5 seconds of being released.

Transmission Duration(s)	Limit (s)	Result
0.760	≤5s	Pass

Test plot as follows:



8 Test Setup Photographs

Refer to the < MP5_Test Setup photos-FCC>.

9 EUT Constructional Details

Refer to the <MP5_External Photos-FCC> & < MP5_Internal Photos-FCC>.

--End of the Report--